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Heart Failure and Cardiomyopathies

REDUCED CARDIAC INDEX IS NOT A SIGNIFICANT CONTRIBUTOR TO RENAL DYSFUNCTION IN HEART FAILURE

Poster Contributions
Poster Hall B1
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Session Title: Many Faces of Heart Failure
Abstract Category: 14. Heart Failure and Cardiomyopathies: Clinical
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Background: Renal dysfunction (RD) is common in patients with heart failure. It is widely held that this association is primarily driven by reduced cardiac index (CI). Recent studies have challenged this assumption, but much of this data is from retrospective single center studies or the randomized Evaluation Study of Congestive Heart Failure and Pulmonary Artery Catheterization Effectiveness (ESCAPE) trial where clinical equipoise existed for use of a pulmonary artery catheter (PAC). Our goal was to comprehensively evaluate the relationship between CI and RD, using data from a multi-center study of patients undergoing clinically indicated PAC placement.

Methods: Patients enrolled into the registry portion of the ESCAPE trial with data on renal function and CI were evaluated (n=390). Estimated glomerular filtration rate (eGFR) was calculated using the chronic kidney disease epidemiology collaboration equation. To evaluate for a possible non-linear relationship, eGFR to CI correlations were evaluated across tertiles of CI.

Results: In the overall registry, there was a small but statistically significant paradoxical relationship where higher CI was associated with worse eGFR (r= -0.12, p=0.015). In both the bottom (CI <1.8 L/min/m2) and top (CI >2.3 L/min/m2) tertiles, there was no relationship between CI and eGFR (p≥0.49 for both). In the middle tertile (CI 1.9-2.3 L/min/m2) a paradoxical correlation between higher CI and worse eGFR was again present (r=-0.241, p=0.008). Notably, patients undergoing PAC placement for a clinical indication of progressive RD (r=-0.36, p=0.03), cardiogenic shock (r=-0.06, p=0.46), unclear hemodynamic status (r=-0.18, p=0.018), or inotrope dependence (r=-0.33, p=0.02) had either an inverse or no relationship between CI and eGFR.

Conclusion: In this large, multi-center population of heart failure patients with clinically indicated PAC placement, we found no significant association between lower CI and RD. This was true in the overall population, at different levels of reduced CI, and across indications for PAC placement. These data indicate that reduced cardiac index is unlikely to be a substantial contributor to RD in patients with HF.